

ABSTRACT OF THE INVENTION

The invention provides methods for labeling a molecule by contacting a sample molecule with a solid support coupled to a chemical group comprising a cleavable functional group, one or more functional groups, and a reactive group for the sample molecule, under conditions allowing the sample molecule to covalently bind to the reactive group; and cleaving the cleavable functional group, thereby releasing the sample molecule comprising the one or more functional groups, which can be a tag. The invention also provides a solid support covalently coupled to a chemical group comprising a cleavable functional group, a mass spectrometry tag and a reactive group for covalently attaching a sample molecule, wherein the cleavable functional group, the tag and the reactive group are positioned relative to each other to allow transfer of the tag to the sample molecule upon cleavage of the cleavable functional group.